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ORIGINAL COMMUNICATIONS.

CONTOUR FILLINGS vs. THE FREE SEPARATION METHOD FOR THE PERMANENT PRESERVATION OF THE TEETH.*

BY DR. C. W. STRANG, BRIDGEPORT, CONN.

In the consideration of this subject, so much has already been said and written that I can hardly hope to add anything new, except, perhaps, to express conclusions reached after a number of years of experience and close observation.

In looking through the pages of our dental publications, one cannot fail to notice the diversity of opinion expressed by different contributors. The free separationist is firm and positive in regard to his method, while the champion of the contour is no less decided; and it would be strange, indeed, if a fair proportion of the members of the profession should not pass along in their calling amid the clouds and mists of indecision. If any of this latter class are present, I trust I shall be able to contribute something that may influence you in favor of the adoption of a system, the practice of which inspires a love for the work, a determination that each succeeding operation shall be more nearly perfect than the former, and which accomplishes

*Read before the Conn. Valley Dental Society.

more fully the desired end, namely, the permanent preservation of the teeth. Any method which, in its workings and results, does not measure up to this standard should, in my opinion, be regarded with misgivings. It is charitable to suppose that all are seeking after the truth, with an earnest desire to do that which is best for the individual cases presented for treatment.

About ten years since, Prof. Robert Arthur's work came into the hands of the profession, and, while we admire and honor the man whose spirit of thoroughness and conscientious devotion has impressed itself upon, and is reflected by, his work, yet, in the light of the present, we fear the results of its teachings have brought sorrow, discontent and discouragement to the hearts of many confiding men. Professor Arthur claims, First. "That all the teeth of every individual, with rare exceptions, may be preserved. Second. That decay may be prevented from occurring at places where it is most destructive, and requires the most difficult, painful and expensive operations for its arrest. Third. That all the attention necessary for the certain preservation of the teeth (provided it be given in time) is of simple character, and quite within the ability of any dentist of ordinary acquirements. Fourth. That the pain usually attending dental operations may be entirely avoided. Fifth. That, as the operations required are of simple character, the cost of the preservation of the teeth will be diminished."

All this, with the advent of the dental engine, armed with corundum disks, dental reamers, etc., to render a simple operation still more easy of accomplishment, so terribly depleted the ranks of the contourists that it is doubtful whether a score of them could be found in all the land. The Professor concedes that, after the operation of separating the teeth has been skillfully performed, the most scrupulous care, both upon the part of dentist and patient, will not prevent a recurrence of decay in *some* instances. Probably most of us have learned that all the care we can bestow, united with the best efforts of the patient, is unavailing, and decay will recur in a *majority* of the cases so treated. This may not follow where there is not a crowded denture; but I have not yet discovered one in which the good accomplished has not been more than overbalanced by evils present. A large proportion of those applying for our services are young people; decay is present upon the approximal surfaces of molars and bicuspids. If we resort to the free separation and flat filling method, how soon are some of the spaces closed, while others are widened, thereby disfiguring the mouth, and,

after a few months, a condition of things exists which we must acknowledge to ourselves will soon render former operations defective and useless; for we cannot doubt that the forces which have disintegrated and destroyed well-formed enamel, will soon tell at the margins of the most perfectly adapted gold fillings in the same localities. We see that in the near future more tooth substance must be removed, for it must be considered an imperative duty to keep the spaces free when the teeth have once been separated. This state of affairs is very favorable to the acceptance of "new departure" theories, and practices, as well, for gold fillings inserted "by hook and by crook" in this class of cavities are not reliable. It is no small annoyance to hear so frequent complaints in regard to the wedging of food in these spaces and the discomfort occasioned thereby. It is neither an easy or agreeable task to examine a mouth which has been subjected to this treatment for a few years. One must needs enter the field well provided with floss silk, wedges, and Jarvis' Separators, to decide at one sitting whether defects exist; and, when found, I am persuaded there are few who covet the privilege of repairing them or reinserting fillings.

Several cases have come under my notice in which the roots of the superior cuspid and bicuspids have gradually approached until, to all appearance, the septums of alveolar process have been absorbed, while the external and internal plates remain quite firm and unchanged. "United, they stand," or stay. If a full denture is to be retained permanently and *comfortably*, I believe this end can be obtained by contour filling only. It will not be necessary for me, in this paper, to enter into a description of the operation, as all its details were fully given by Dr. Webb to this society at its last annual meeting, and appear in the September number of the Dental Miscellany. Permit me here to personally express my thanks to Dr. Webb for very valuable suggestions and information given in his excellent paper.

By this method decay is not only prevented, but the teeth are retained in their sockets in the precise position where nature designed they should be; while the advantages afforded for subsequent examinations are apparent, no difficulty being experienced in passing a delicate exploring instrument along all portions of the marginal walls. The gums are protected and remain healthy, as there can be no packing or wedging of foreign substances between the teeth. Is the propriety of opening from the masticating surface and making complicated operations questioned, where *seemingly* only small cavities exist?

I think that almost invariably, in these cases, when the rubber dam has been adjusted and all the moisture has been evaporated by the application of alcohol and the use of the air syringe, a greater portion of the enamel will be found disintegrated than was at first suspected; all this must be removed and the parts protected. This can be most effectually accomplished by contour filling.

A word in regard to filling materials to be employed in making these operations. While I think cohesive gold indispensable in most of them, yet, where time to the operator and expense to the patient must be economized, tin foil may be used in cavities not exposed to view. It is true that fillings of this kind, exposed to much attrition, will wear away, and at some future time may need to be partially renewed; but even with this disadvantage, the tooth operated upon can be so contoured and kept from actual contact with the adjoining tooth, that a recurrence of decay will not follow. In the preparation of approximal cavities for the reception of tin fillings, depend upon no retaining points or fissures in the masticating surfaces for the retention or strength of the filling; while the body of the cavity is so prepared as to retain the filling, prepare each fissure so that it may retain the portion placed therein. If approximal cavities are to be operated upon, and contouring with gold or tin is out of the question, as age, physical and other conditions are to be considered, prepare them as simple cavities, leaving the general form of the tooth unimpaired, and fill with Hill's Stopping. This soon changes upon the surface, and actual contact of enamel with enamel is prevented, decay is retarded for a season, at least, and the mouth is left in a favorable condition for subsequent operations of a more permanent character. Regarding, as I do, the method of free separation ruinous and demoralizing in all its aspects, respect for my seniors in the profession would deter me from proffering advice to them; but to those who have just entered the profession, or are about to do so, I would say, never resort to it as a means of saving the teeth. While the contour principle involves close application, hard work, and is perhaps less remunerative on the whole for the time occupied, yet, to the conscientious operator the satisfaction arising from having done the best for those who have placed themselves in our care, is a nobler recompense than *mere* dollars and cents.

ALBUMINOIDS.

BY CHARLES MAYR, A. M., SPRINGFIELD, MASS.

In its number of January, 1882, the N. E. Journal brought a highly interesting abstract from Dr. Elsberg on the Cell-doctrine, which is worth being read by every dentist until he understands it and should it be necessary to read it a dozen times. Only by being capable of understanding with ease such articles, the dentist rises above a tooth-driller and tooth-plumber. But modern science is no longer a child's play that one may take in between roast-beef and pie. It requres careful and assiduous work to be mastered. As a kind of chemical complement, and to facilitate the understanding of discussions about scientific histology, we give a small lecture on albuminoids.—Chemists designate with albuminoids or proteine-substances all the different kinds of living matter, that is, of that matter which, if supplied with proper circulation, will exhibit phenomena of contraction, of movements, assimilations, etc. Many varieties may be distinguished. We only will give the chief ones and their reactions. The source of the supply of the albumen properly is the white of the egg, and the names of albumen, albuminoids, etc., are indeed derived from this substance. The white of an egg is an organized substance. Can it be called live tissue? Where is its "vitality?" We might hesitate to call it so. If left to itself it will never start up any other process but that of chemical decay; the warmth alone by affecting the composition of its bioplasson will start up the first movements; and just as a small stone may start an avalanche, thus the slightest impulse is sufficient in tissue provided with proper bioplasson to produce the phenomena of "life." Yet I do not consider it yet as proved, that there does not exist some kind of life in an egg; the porous shell certainly admits of an exchange of air, and, if I am not mistaken, some years ago, a physiologist proved that eggs have a kind of respiration, that is, an exchange of oxygen and carbonic acid through the shell; if this should be conclusively proved, an egg—I chiefly have in view birds' eggs—would resemble a marmot in its winter sleep; some slight action is still always going on, until the warmth by allowing the chemical changes to take place more rapidly produces more rapid circulation and more "life." The albumen of the egg considered chemically is a combination of an organic substance with salts. Most chemists consider the salts like impurities, yet to me the salts seem of the highest importance since they are certainly the cause of the varieties of different kinds of

albumen—nay, of the differences of eggs of different animals. The composition of egg-albumen is—abstracting the salts:

Carbon, 53.4
Hydrogen, 7.0
Nitrogen, 15.6
Oxygen, 22.4
Sulphur, 1.6

The salts, amounting to about five per cent., are chiefly carbonates, phosphates, chlorides of lime, soda, potassa, etc. They are not simply accidental, or impurities, but they are essential. If one dries carefully egg-albumen at about 40 degrees C. (104 F.), one obtains a pellucid mass containing all the salts. By pulverizing finely this mass and treating rapidly with water one may dissolve out the salts,—the water here acts like an acid—but the remaining albumen is no longer soluble in water; it has become a different substance. Another remarkable fact is that, though fresh egg-albumen is of alkaline reaction, it contains lime salts in solution, showing that alkalicity does not necessarily preclude the solubility of lime salts,—of consequence in the theories about decay of teeth! If one heats a solution of egg-albumen,—can it be called properly a solution, Dr. Heitzmann?—the albumen becomes insoluble in water; it coagulates,—this coagulated albumen is again a different substance from the original one. Most mineral-salts precipitate albumen from its solution without combining with it in larger quantities than what some chemists term "impurities;" every time we obtain a different kind of albumen; in fact, the simple egg-albumen, the easiest to obtain and experiment upon, is so full of dark and difficultly explorable reactions, that the chemist who will clear up this mist will have done much. Moreover, every slight heating produces modifications in the combination of albumen and water. The chemical constitution of albumen must be highly complex. We understand with the term chemical constitution the arrangement of the groups of atoms existing in the compound, e. g., the constitution of common ether is: Two molecules of the radical ethyl, that is of the fundamental compound of alcohol, combined with one molecule of oxygen; or, more decomposed still, expressed by the formula

$$CH_2—CH_3—O—CH_3—CH_2.$$

CH_3 is marsh-gas; $CH_2—CH_3$ is ethyl, etc. According to the analyses the formula of albumen cannot be less than $C_{89}H_{140}N_{22}O_{28}S$, while ether is only $C_4H_{10}O$, and has already quite a constitution. If we further reflect, that water is essential, that the salts have to be

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introduced into the formula, every chemist will understand that we do not need any other force than those of the chemical radicals to explain richly all phenomena; only at present our chemical knowledge does not yet quite grasp the multitude of atoms and radicals in this compound. But let us again descend to gross facts and words. Similar to the white of the egg is the albumen in the yolk, but already different, consisting of

Carbon, 52.8
Hydrogen, 7.3
Nitrogen, 16.4
Oxygen, 22.3
Sulphur, 1.2

It is slightly acid in its reactions.

Blood contains some albumen of about the same composition and reaction as egg-albumen. In the crystalline lens and within the blood-corpuscles, another albuminous substance is contained, termed *globuline* or *crystalline*. Its composition is

Carbon, 54.3
Hydrogen, 7.0
Nitrogen, 16.5
Oxygen, 21.00
Sulphur, 1.20

Hence more carbon than the first.

Haemocrystalline is the albuminoid combined with the haemoglobine of the red blood-corpuscles; the haemocrystalline is not colored, but capable of crystallizing; its composition is almost identical with the foregoing variety.

Quite different is the red-coloring substance of the blood-corpuscles; it is called *haemoglobine* or *haematine*, and contains 6.6 per cent. of iron. If blood stagnates in abscesses or exudations, or in aneurisms, one often finds red crystals. These are entirely different from the foregoing: they contain almost no iron, but in its place oxygen; they are insoluble in water and diluted acids,—the substance has received the name *haematoidine*.

Fibrine is the coagulating substance in blood, from which it may be obtained quite pure by beating and kneading the coagula in a stream of water. Fibrine is almost unknown in its soluble modification; as soon as removed from the organism it will coagulate with or without access of air. Is it perhaps nothing but bioplasson, which dies if not in contact with proper circulation? If the water contains salts,

fibrine may be dissolved in it; the solution shows the reactions of common albumen. Not all fibrine is soluble in water containing salts; the fibrine of arterial or diseased blood often does not dissolve, while that from venous blood always is soluble. In contact with oxygen it takes it up and gives off carbonic acid. The ashes in fibrine form only about 0.5 per cent. Its composition is

Carbon, 52.6
Hydrogen, 7.0
Oxygen, 21.8
Nitrogen, 17.4
Sulphur, 1.2

The substance of the muscles consists of ***musculine*** or ***syntonine***, a substance resembling fibrine very much. Its composition is

Carbon, 54.9
Hydrogen, 7.3
Nitrogen, 16.2
Oxygen, 20.6
Sulphur, 1.1

Caseine is the albuminoid in milk; it is distinguished from all the other albuminoids by the property that it does not coagulate at boiling heat. Many substances produce coagulating: acids, salts, the secretion of the stomach of calves. Coagulated caseine is our cheese, generally coagulated by the secretion of a calf's stomach, which always adheres to the mucous membrane which is thrown into the milk in the process of cheese-making; caseine is even slightly soluble in alcohol if an alkali be present. Its composition is

Carbon, 53.6
Hydrogen, 7.1
Oxygen, 22.6
Nitrogen, 15.7
Sulphur, 1.0

Similar to albumen, fibrine, caseine in animals, we have albumen, fibrine, caseine in plants termed gluten (in wheat)—corresponding to fibrine, or legumine (in beans, peas)—corresponding to caseine. Many of the ferments like diastase, pepsine, pancreatine or tryptine, etc., have again different but similar compositions. Quite different in their composition are connective tissue and cartilage, e. g., cartilage is composed

Carbon, 50.0
Hydrogen, 6.6
Nitrogen, 14.4
Oxygen, 29.0

To sum up, we may say that bioplasson (or protoplasma) is a chemical, highly complex compound of an albuminoid with a certain amount of water and salts. That it assumes the shape of a net-work in all tissues—teeth not excepted—is a consequence of similar laws to those which give to a crystal its shape, though at present we do not yet understand much of it clearly.

The protoplasma-fibers of the teeth, or as they are often termed the bioplasson, resemble syntonine. How can a dentist expect to talk very sensibly about teeth without having any trace of a conception as to the nature and chemical reactions of this kind of fibrine? All the crude theories of a tooth being a block of lime with a few organic impurities to be filled like a mineralogical specimen, with a gold plug in every crack and hole, simply to render it more valuable to the proprietor, must appear to every student as a sad lack of knowledge and common sense on the part of the advocate of such inadequate views. Probably most of the dentists have heard, and we hope may hear still for many years, Dr. W. H. Atkinson speaking about embryonal condition, etc.; they will not understand one particle of it unless they compare carefully the reactions of syntonine, or the normal fibers of a tooth with those of albumen or the dissolved fibres; the first are the crystals, while the second is their concentrated solution. All we wish to attain by this article is to show to the profession the need of chemical studies, chiefly of the albuminoids.

THE MICROSCOPE.

BY A. M. ROSS, CHICOPEE, MASS.

Prof. J. J. M. Angear, President of the Microscopical Section of the Iowa State Medical Society, said, at a recent meeting, that "the scientific medical man could get along as well without the stethoscope or the speculum as without the microscope." Does it occur to the dentist seeking attainment of truth in the principles of his profession, that he might as well try to gain these as well and as soon without his engine and its equipment as without this instrument? Perhaps a novice in the use of the microscope, such as myself, cannot emphasize his belief that the microscope is as essential to progress with the dentist as are his many improved appliances for perfecting his manipulative ability. I think, however, that the time is rapidly coming when this fact will be more generally recognized than now; that the dentist must

better and more fully understand the tissues that in such varying conditions come daily under his hand for treatment. It is not the object of this paper to speak of any revelations by this instrument, that being a subject that can be better presented by those better qualified. But I wish to present to the readers of this Journal the fact that it is not necessary to invest a small fortune to secure a good compound microscope and boutique of tools and accessories—some of which every dentist has on his operating case.

For a description of the *good*, low-priced stands I here give, I am indebted to Dr. Carpenter's last edition of "The Microscope and its Revelations," attested to by the experience of personal friends who have made the subject a study, and as a result of my own observation. There are in this country and Europe makers of microscopes who furnish an excellent working instrument for less than fifty dollars, plus the duty, if imported. One of the best of these is made by the Messrs. Ross, of London, known as the ***Ross (Zentmayer) Student's Microscope***. This instrument, in case, costs ten guineas ($48.33).

There is an instrument recently placed on the market by George Wales, of New York, called the "***New Working Microscope***," that has features of excellence, and, as a stand, for the money, is first-class. Price, with two eye-pieces and two objectives, thirty-five dollars. These two being of the best of this class of instruments, it is unnecessary to mention the many others that may be equally good. Attention is called to these microscopes, *not* as an advertisement of them, but because they are excellent, and that many dentists and others are deterred from investigating the subject with a view to buying, because of the belief that from $100 to $500 is necessary as an investment to secure a practical microscope. The *value* of these instruments is in ratio with the perfection of their optical parts, particularly of the object-glasses; and these stands mentioned, with the best corrected glasses, will give as certain results as when the same glasses are used upon the highest-priced stands. Of course, it is understood that, for the price, first-class oculars and objectives cannot be furnished; but the oculars are usually very good, and, better objectives selected in place of those usually furnished, will bring the usefulness and reliability of the instrument to a first-class standard.

The objectives are what constitute the real value of the microscope. They should be selected with the greatest care, the distinctive features of value to the histologist being clearness of outline or definition of the object, and penetrating power.

In glancing over a catalogue of accessories to the microscope, an inexperienced person is overwhelmed by the many additions that it *seems* necessary to make in order to be in *good working condition*, and this is not to be wondered at inasmuch as journals upon microscopy, as well as compilers of catalogues, devote so much space to the consideration of the different kinds of dark ground or parabolic illuminators, polariscopes, etc. These produce very pretty effects and in certain lines of research, for instance, such as measuring the angles of crystals, may be valuable accessories; but they are of no value to the histologist. What is essential to him, is an ability to produce a faithful image of the object under examination, more or less amplified, as the character of investigation may require, with glasses that will define the object sharply and that will permit a deeper view of the object than simply the surface thereof. Now, the objectives that give these results are known by the term "medium angle;" that is, they do not permit as much light to enter the objective as those objectives termed "high angle," and in order to obtain the necessary light when using "medium angle" objectives of high magnifying power, a system of lenses has to be used between the object and the light, as a condenser, and it is a valuable accessory. Such a sub-stage condenser may be easily and cheaply adapted. An eye-piece or a low-power objective will answer excellently this purpose. For those who use a monocular stand an eye-shade is indispensable, and its surface should be dark. I made mine out of black rubber. It is made from a piece of vulcanized rubber about one and a half inches wide by four long with a circular aperture just the size of the tube cut in one end. When it is in position the eye not in use comes before this shade and should not be closed. There is by its use no strain to the eye muscles. There are none who use the microscope who are better qualified to fit up their own accessories than are the dentists. They have the ingenuity and facilities for making almost everything needed in the line of helps that other people have to buy.

For less than one hundred dollars a good microscope may be had with such glasses and accessories as shall place the possessor in position to commence and prosecute the study of histology. For a *new chair* a dentist will invest from $150 to $200. Let me urge all those who are thinking of some such change as this in operating chairs, to work a while longer over the old one, and buy a microscope.

DENTAL FURNISHING.

The statement of a boy, while in our office not long since, that it was pretty well filled with "bric-a-brac," may not be very far from true as regards many of our modern dental offices, at least if we somewhat misapply the term. That a dental office should be reasonably well furnished, and free from all that would indicate lack of care or cleanliness on the part of the dentist, would seem apparent to all, after so much has been said on the subject. That enough has not been said would seem equally apparent, from the fact that so many offices are not only unsuitably furnished, but so neglected and filthy as to be disgusting to the most negligent of patients. It is without doubt better to have an office quite simply, neat and tasteful, than the most lavishly furnished, with an appearance of slovenliness. However, whether it be of the plainest or most lavish style, the modern dental office absolutely demands, in its *operative departments*, furnishing with a liberal hand and an even greater manifestation of neatness. We look back to the advent of cohesive gold and the resulting extended operations in filling teeth, as bringing the necessity for, and the inventive skill to produce, the many inventions and appliances we now find so absolutely essential to success. If we were restricted in our operations to the facilities at hand of even a few years ago, we believe there would be a large turning back to the old styles of operations and the necessary loss of many teeth which are now saved to continue a comfort to patient and testimony to the achievements of modern dentistry.

Though our fine operators are but few compared with the demand, still there are many, and our Webbs and Browns are sufficient to enthuse many others with the determination not to be outranked. But let us not in our exaltation forget our indebtedness to the many inventive minds who have done so much in the production of instruments and appliances with which to make these beautiful operations possible. Truly, we should remember with gratitude such men as Barnum, Morrison, Wilkinson, and many others, who have not only given time but money for these purposes.

When our next difficult case presents itself, let us stop for a moment and imagine ourselves without the rubber dam, or the engine so indispensable, or with that old chair over which our operations were so wearily performed. The many appliances and improvements comparatively new to us have largely conduced to make us what we are today. But let us not rest here, for doubtless there is still room for improvement. The inventions of the day are too many and too wonderful for us to say that anything is impossible.

INVENTION.

SELECTIONS AND ABSTRACTS.

LOCATION OF THE MENTAL FACULTIES.

Of all the numerous topics which are the common field of the physician and the biologist, none is of as great interest, both in its practical bearings and intrinsically, as a fascinating theme, as that of the location of mental faculties in the brain. Year by year scientific inquiry is narrowing down the question of the existence of the mind into the functional realm of those great masses of nerve tissue, which, filling out the cavity of the skull, have already formed an empirical and unconscious recognition by the ancients when they endowed the Goddess Minerva with a higher brow than Venus, and Apollo with a greater facial angle than Bacchus.

For a long time observers contented themselves with mere measurement of the volume of the brain; a heavy brain was supposed to be capable of higher mental action than a light brain; the elephant and whale were contrasted with the alligator and tortoise, and after bitter contests waged in scientific societies, the conclusion was arrived at that only animals approaching each other in size, as well as zoölogical position, should be compared to obtain data. The original proposition is sustained by the fact that in weight proportionate to that of the body the elephant exceeds the hippopotamus—the dog, the fox—the chimpanzee, the baboon—the marmoset, the squirrel—the rabbit, the kangaroo—and so on through the list. The intellectual standard finds its expression in a greater brain-weight among animals.

Any one who has glanced at the older anatomical atlanti will have been struck by the picturesque folds and festoons into which the brain-surface is thrown. He may compare the folds in the representations of different authors and will arrive at the conclusion that they can have no definite importance, because they differ so absolutely in every diagram examined.

The fact is that these folds or corrugations, familiarly known as the convolutions of the brain, were later recognized to be very methodically and regularly arranged, and to follow a distinct plan for each zoölogical species, including man. The old anatomical masters, ignorant of this fact, allowed their draughtsmen to fill in the details according to their fancies, and these naturally led the latter to pay more attention to the picturesque than the true. Now the contest as to the location of mind in the brain took another form, the opponents

of the materialistic theory, that brain and soul are united, tacitly admitted the general proposition, and orthodox anatomists endeavored to discover as numerous and as decisive criteria by which to distinguish the brain of man from that of the ape as diligent research could unearth. But one barrier after another which they erected has been swept away by their opponents. Owen's claim that the apes had no lesser hippocamp, was demolished by Huxley, the Island of Reil has been demonstrated in animals far below the monkey tribe, the cerebral overlap is recognized to be decided in the anthropoids and in other monkeys as in many human subjects, and even an indication of an opercular formation has been found in defective human brains, while the last criterion, the alleged absence of the "*Zwickelwindung*," in man, has been demonstrated to be faulty by Parker, of Philadelphia.

The great similarity of the chief surface features of the monkey's brain with those of the human, led Ferrier and Munk, after preliminary experiment by Hitzig and themselves, to attempt the isolation of willed muscular movements, and of special sensory perception in the cerebral convolutions of the monkey. The researches of Meynert had shown that anatomically the brain "bark" or "rind" (*cortex cerebri*) occupied the position of a mirror, as it were, on whose inner face abut the photophone wires represented by nerve bundles, transmitting the messages from the outer world. Meynert found that the nerve fibres from the eye, the skin in general, the ear, the nose, and tongue, went to special convolutions, and that to other convolutions went fibres which controlled muscular movements. Now the experiments of Munk and Ferrier confirm the anatomical premise of Meynert, in its general bearings. They found by cutting away a given part of the brain, blindness would result, the removal of another part would be followed by deafness, of still another by paralysis. They and others also established that if those parts whose removal was known to be followed by paralysis, were instead of being injured, stimulated (by electricity) special motions could be produced at will. In other words, these investigators found the keys of the mind before them in the convolutions of the brain, and by touching a special key, were enabled to forge the will signature of the animal, as it were. Special parts of the human brain, when the seat of disease or of injuries, are shown to have similar functions. A man has an apoplectic stroke, or an abscess, or a softening, or a tumor of the brain. If that disturbance is in one part he may be blind in a portion of his visual field, or he may lose the memory of words, or their articulation, or the

ability to write, or he may be paralyzed in one arm, or one leg, or only on one side of his face. If the disturbance is extensive, several of these symptoms co-exist. It is noteworthy that these disease experiments, if we may so term them, confirm the physiological experiments made on monkeys in a remarkable manner, and it seems that the great problem of the relation between brain and mind is nearing a solution through different channels of research, approaching the same goal.

Science, Dec. 17, 1881.

RESTORATION OF THE HEART'S ACTION WHEN IT HAS CEASED TO BEAT.

In the British Medical Journal, Dr. Jago suggests that when the heart fails in cases of anæsthesia, etc., we should prick it with a fine long needle, but gives no cases. The following cases, by Dr. Reid, are interesting. He says: On reading Dr. Jago's article, it reminded me of an experiment in my college days. I do not remember what induced me to kill a mouse by a blow on the head, and rip it open to see the heart beat. It did not. I pricked it with a needle and set it a-going. It stopped after a time; then I gave it a second prick, and a few pulsations were distinctly seen. When I was in petticoats, my father was sent for to a girl in a fit. He was out, and when he came home was informed of the fact. "How long since? and any second message?" Being told he thought he need not go, my mother suggested he "ought to go," which he did. He found the girl dressed in her grave-clothes, and "laid out" on a linen-covered table. He examined her, and found some warmth over the heart. He ordered hot water to be brought, not scalding hot, and poured it into a jug, tore her shroud open, stood on a chair, and poured a continuous stream of hot water, until the throbbing of the heart was distinctly seen. That girl was the mother of several children before I left Scotland, in 1848. My mother used to laugh, and take her share of the credit of her restoration to life.

An old man here, Robert Robinson, several years before his death, took a fit, and apparently expired on the floor, where he was lying pulseless and breathless. The heart had ceased to beat, and I was told that "he was beyond any doctor's power now." I felt some warmth over the heart, and I tried my father's remedy; and, to the wonder of spectators, the septuagenarian revived, and lived several years afterward. Hot water can easily be obtained; and no one can object to such an experiment.—*Braithwait's Retrospect.*

EDITORIAL.

We have been much gratified by the reception thus far accorded to the JOURNAL. No word of discouragement from any source has been received; but, on the contrary, much of congratulation and good cheer has been extended from various sources. Arrangements have been completed effecting the permanency of the JOURNAL, leaving the managers free to devote their best efforts to the realization of what constitutes their ideal of a Dental Journal. Papers from some of the best men in the profession, and also from medical sources, are promised and in course of preparation, upon very important subjects, which will appear shortly. In brief, we expect to make the JOURNAL *indispensable* to the profession.

In this number of the Journal, we introduce a department under the title of "*The Operating Table and Laboratory.*" This department will be under the special supervision of one of our "*Associated Dentists,*" assisted by other members of the corps, who is noted for his mechanical and inventive skill, as well as his success at the operating table, and in the laboratory. He is already the inventor of several appliances of great usefulness in daily use by the profession. His effort in this new field will be to share with the profession, through these columns, the results of his experience and observations, and render such hints and suggestions as will be of special advantage to every operator in both departments of the profession named.

He will be glad to receive any helps from any member of the profession, in making this feature of the Journal a complete success, duly accrediting to the author thereof such assistance.

Let this department, gentlemen, be a sort of *public clinic* (in print) of special methods in practice, new appliances, etc. Cuts of such appliances, or pet instruments, will be of special advantage in illustrating.

We have opened a space for chemical facts and hints that might seem of interest to the profession. We request every one of our readers to favor us with hints and queries; every contribution will be thankfully accepted.

RAMBLINGS AMONG THE MONTHLIES.

The *Cosmos* of January, 1882, opens with an article of general interest, by J. L. Williams, North Vassalboro, Me., on the Beginning of Physical Life. We are sorry, that at very many points—we might say every other sentence—we have to disagree with the author. The passage quoted from Beale, "Every particle of the bioplasm of living matter came from a pre-existing particle," etc., seems to us wrong in this form; at least the sense seems to be, that every particle of "bioplasm" is derived from a particle of "bioplasm" digested or otherwise taken up. This statement is easily proved erroneous. How much living matter or "bioplasm" is in a seedling of a tree? Say half a grain; how much is in the tree? Perhaps some pounds. Whence did this come? Experiments have proved beyond doubt, that the ammonia, the carbonic acid, the water and the salts of the soil can be made to combine by previously present "bioplasm" and to form entirely new "bioplasm;" this "bioplasm" did not pre-exist! This process is furthermore nothing so very unique and isolated as one might think. All chemists know a great number of examples, where the existence of a certain substance facilitates very much the formation of the same substance from its constituents. We only cite the manner of making vinegar by letting a mixture of brandy and water trickle over wood-shavings. If the shavings are new, little vinegar only is formed, but, when once the shavings are soaked with vinegar, the process of producing vinegar goes on rapidly. Or, in preparing certain chlorinated ethyl-combinations the presence of a certain quantity of the substance to be made is almost necessary to determine a uniform process of combination. In over-saturated solutions of any salt nothing produces quicker the separation of the crystals than throwing a crystal of the same salt into the solution. Hence the formation of "bioplasm" is nothing so isolated, without analogies, as the author wishes to convince us; the history of chemistry has taught us to be very careful in announcing a new law, where analogies bind a case to many similar ones, for which we have already either laws or at least a certain principle underlying, which we can already, though dimly, perceive. The synopsis of the germ-history is well given and the cuts show well-prepared specimens and good microscopes. The last twenty lines breathe that narcotic philosophy of the: because *we* do not know it, it is impossible to know it. The author makes a weak point by basing his philosophy on the sentence: "Who has ever been able to trace and connect these changes of a germ?"

etc. Many a philosopher has been wrecked on this supposed inability. But the learned doctor certainly himself feels the immense difficulty of what he demands of a science which is hardly yet weaned, which has still to settle the grosser facts of histology. We confess that we were unable to get anything out of the sentence: "Life is not the cause of the form in organisms,—it is the form itself." We puzzled and worked long over it, but could not make out anything whatever. The last sentence of the article caused us the feeling of ants crawling about within our skull after we had studied a quarter of an hour to obtain a clear and exact idea of what was meant,—without success.

In the proceedings of the American Dental Association, Dr. Litch is reported as giving statistics of Darin about the relative number of deaths caused by chloroform, ether and nitrous oxide. The figures seem to us deceptive and not quite reliable. We may safely assume, that every person in the United States receives in the average one application of an anæsthetic in twenty years. This is certainly below the real figure; this gives 2,500,000 applications of anæsthetics during a year; according to the table of statistics, if all were nitrous oxide, we would have 25 deaths of it during the year,—far above the actual amount! If all were ether, we would have 90 deaths, and in the case of chloroform about 700. The real figures, at least in the case of ether and laughing gas, certainly fall very much short of these statistical data.

We do not know exactly, how far some members of dental societies might be benefited by reading the article in the *Dental Register* of December, 1881: What ails dental societies? Another interesting article in the *Register* is an address of John S. Billing, M. D., On our medical literature. According to it, the most industrious contributors to medical literature are the French doctors, 1 in 10 writing for the papers; next stand the Germans, with 1 contributor to 13 doctors; England has 1 to 17, Italy 1 to 18, Spain 1 to 18, while the United States have only 1 "literary feller" among 23 doctors,—less than Spain! In new medical books for 1879, France leads with 187, Germany being next with 110, while the United States with 21 books rank lower than Italy; but if we include the periodicals and pamphlets, the U. S. rank third with 310 publications; France, with 541, being first and Germany, with 364, second. In periodicals, the United States stand first with 156 volumes, Germany being second with 129, France third with 122, Great Britain with its 54 standing lower than Italy with 60. Of the original articles, most appeared in American Journals—

4781; in French, 4608; in German, 4027, etc. In physiology or scientific medicine, Germany alone produced the majority of all publications—59 treatises and 500 articles,—while only 2 treatises and 24 articles appeared from the United States, in fact only one-half of Italy. It shows plainly that, while the Americans are leading on the practical questions, the theoretical investigations have not received that attention which they deserve. We quote a few interesting passages of the article:

"Speaking broadly, we may say that at present Germany leads in scientific medicine, both in quantity and quality of product, and that the rising generation of physicians are learning German physiology. But the seed has gone abroad, and scientific work is receiving more and more appreciation everywhere.

"Seven years ago Professor Huxley declared that, if a student in his own branch showed power and originality he dared not advise him to adopt a scientific career, for he could not give him the assurance that any amount of proficiency in the biological sciences would be convertible into the most modest bread and cheese. To-day I think he might be bolder, for such a fear would hardly be justifiable; at all events, in America, where such a man as is referred to could almost certainly find a place, bearing in mind the Professor's remark that it is no impediment to an original investigator to have to devote a moderate portion of his time to giving instruction either in the laboratory or in the lecture-room.

"The separation of biological study from practical medicine, which has of late years become quite marked in the literature of the subject, has its advantages and disadvantages. Thus far the former have far outweighed the latter, and both the science and the art of medicine have been promoted thereby. But are not the physiologists, or as I believe they prefer to be called, the biologists, separating themselves too completely from medicine for the best interests of their own science, in that they are neglecting human pathology? In our hospital wards and among our patients, nature is continually performing experiments which the most dexterous operator cannot copy in the laboratory—she is, as Professor Foster says, 'a relentless and untrammelled vivisector, and there is no secret of the living frame which she has not, or will not at some time or place, lay bare in misery and pain.'

"Some societies and editors do not seem to appreciate fully their responsibility for the articles which they accept for publication—a responsibility which can not be altogether avoided by any formal

declaration disclaiming it. This is due to the fact that while the merits of a paper can usually be determined by examination, this is by no means always the case. In every country there are writers and speakers whose statements are received with very great distrust by those best acquainted with them. Supposing these statements to be true, the papers would be of much interest and importance; but the editor should remember that a certain number of readers, and especially those in foreign countries, have no clue to the character of the author, beyond the fact that they find his works in good company. In medical literature, as in other departments, we find books and papers from men who are either constitutionally incapable of telling the simple literal truth as to their observations and experiments, although they may not write with the fixed intention to deceive, or from men who seek to advertise themselves by deliberate falsehoods as to the result of their practice. Such men are usually appreciated at their true value in their immediate neighborhood, and find it necessary to send their communications to distant journals and societies in order to secure publication."

The January number of the *Dental Register*, besides introducing itself as a monthly journal, is full of interesting articles. "Wheat Phosphates" is an article of William S. Daffin, M. D. With great skill the author has compiled various sayings of doctors to the effect that there is "something" in natural mineral waters, "something" in natural phosphates, etc., which shows our old friend "vitalized" food looming through the fog. As a sample of new words, invented without any necessity, I mention the "organismal phospheide," as the author designates a certain compound! The difference between wheat phosphates and common phosphates is nothing mysterious. In wheat the phosphates are in combination with gluten, hence when the gluten is dissolved the phosphates are assimilated; while the natural phosphates are often worthless, because they are not given in proper union with albuminous substances, hence of as little use as the phosphates in the urine. In spite of disagreement in some of the more theoretical points, we fully indorse Dr. Daffin's good opinion of wheat and its phosphates.

In the *Independent Practitioner* for January the question of animal or human virus for vaccination is treated by giving the results of a paper of Dr. E. R. Warlomont of Brussels as published in the British Medical Journal. The author declares himself in favor of animal virus.

In the *Ohio State Journal* E. S. Talbot, M. D., D. D. S., gives experiments on amalgams and mercury. To treat them simply here shortly and without entering carefully upon details, "would not do." We propose to do it thoroughly in our next number, and Dr. Talbot may expect criticism. According to the transactions of the Illinois State Dental Society, quite a lengthy discussion followed the paper. Some of the remarks made there seem worthy of being entered into carefully. In this number we send in Dr. F. Searle to open the battle. He is strong enough to win the first fight, which is on the ground of long special experience extending over forty years. Dr. Searle is not only a widely known prominent dentist, but also a man of clear unbiased reasoning.

OUR INTERVIEWS.

We hardly had read that enlightening article in the *Ohio Journal*, of January, 1882, about the mercury of amalgams blackening slips of paper stained with ammoniacal silver solutions, about its oozing out through the skin and the fingers, its direful effects when put into the mouth in the shape of amalgams, etc., when, troubled about our own chances in the insurance company we were just then negotiating with, and of millions of similar amalgam-affected people, we rushed into the office of Dr. Searle to ask—almost out of breath—a few questions. The answers calmed us materially, and for the benefit of similarly affected ones we give them here:

Q. How long has amalgam been used as a filling for teeth?

A. In this country about fifty years; in England somewhat longer.

Q. How long have you used it?

A. I commenced using it about forty years ago.

Q. What kinds of amalgams were then generally used?

A. Those made of silver (either precipitated or filed from coin) and mercury; a few years later, those made of silver and tin, in varied proportions; silver containing a small per cent. of platinum was used for a time, but abandoned—this was previous to 1850.

Q. What is your opinion of amalgams in general?

A. Taking into account their applicability to a large class of frail teeth where no other filling could be used, also the fact, that their cost brings them within the reach of those who cannot pay for gold, I consider them indispensable to the greatest usefulness of dental operations. After becoming superficially sulphurized in the mouth,

their color is objectionable. Practically they may be the better for the black and brown coating of sulphides, as they are insoluble in the normal liquids of the mouth.

Q. Do you think that a dentist, because he makes an amalgam-filling for less money than a gold-filling, may not do equally good work for the patient?

A. The essential work consists in carefully preparing the cavity, and a conscientious dentist would do that just as well for an amalgam as for a gold-filling; he will take the same time in both cases and cannot do this part of the operation any cheaper in the case of amalgam than in that of gold-fillings.

Q. Were you familiar with the earlier discussions of amalgams as a dental filling?

A. Yes. The controversy was carried on for several years through the New York papers and dental journals, extending down to about 1860.

Q. Did you ever meet with a case where the mercury of an amalgam produced salivation?

A. No; not in my own practice or observation.

Q. Did you ever meet with a case of any systemic effects of mercury produced by amalgams?

A. No.

Q. What do you know of the experience of other dentists concerning the effect of the mercury in the amalgams on the system?

A. I have read published reports of constitutional disturbances, supposed to have been caused by the absorption of mercury from amalgam-fillings, most of them very inconclusive, and admitting of other explanations.

Q. Do you think it possible, in view of your own experience, that cases of death from the mercury in amalgams, as reported, were rightly diagnosticated?

A. I do not.

Q. Were you acquainted with the case of the late Mr. N. P. Ames, about which much was said and written several years ago?

A. I knew Mr. Ames and operated for him after his return from Europe. He told me his experience with amalgam-fillings when in London and Paris.

Q. Will you state some of the prominent facts as told you?

A. Mr. Ames had some large amalgam-fillings put into his teeth in London. Soon—I think a few days—afterwards, he went to

Paris. When the remains of Napoleon I. were brought back from St. Helena, Mr. Ames was out to witness the procession. He was obliged to stand for several hours, five, I think he said, upon a fence or some elevation in the rain, surrounded by a crowd so large and compact that he could not leave his position. When the crowd dispersed he found himself so benumbed and rigid that he had to be carried to his hotel. His London physician told him that the amalgam-fillings caused his trouble, and he had them removed. After his return home he was under the care of his family physician. He lived an invalid several years after his return. His physician, Dr. Bemis, in a letter to the editor of the *Dental Recorder*, emphasizes that he never dreamed of attributing his illness or his death to amalgam-fillings, or to any operation whatever upon his teeth.

Q. Are you able to distinguish a "metallic odor" in the mouth in the cases of amalgam-fillings?

A. What do you call "metallic odor?"

Q. I am entirely unable to say what it is, or how it smells; the only metal I know which has anything like a peculiar odor is tin,—iron, copper and lead only under special circumstances—though I do not know why the odor should be called metallic; it is an odor, and that it comes from a metal is not perceived by our nose, but by our eyes, and in many cases by our fancies. Mercury is entirely without odor, as I convinced myself by breathing the vapors of mercury at all degrees of heat,—by the way, without the least systemic effect.

A. I have never suspected the odors of the breath having a metallic origin.

Q. Did you perceive, or did the patients complain of, any odor or taste in the case of tin-fillings?

A. Yes,—more of the taste, perhaps, which I should define as resembling the sensation one experiences if one pole of a battery touches the tongue and the other some other part of the body.

Q. Which metal besides silver and tin—and of course mercury—do you think most beneficial in an amalgam?

A. Gold. Perhaps its chief effect is on the color; it makes an amalgam whiter and harder.

Q. Did you get any good results from platinum in amalgams?

A. I do not like it.

Q. Has cadmium been combined with other metals for dental amalgams, and with what effect?

A. Dr. Evans, of Paris, introduced it into the practice. He spoke

very highly of it at first, but afterwards he retracted his first opinion of it.

Q. What were the disadvantages of cadmium?

A. It produced a yellow deposit in contact with the tooth, and destroyed itself.

Q. The yellow deposit is no doubt sulphide or oxysulphide of cadmium, both of which are yellow.

A. I could give you the opinions of many men in the profession with regard to the harmlessness of amalgam-fillings, e. g., Dr. Elisha Townsend—as published in the News-letter, Philadelphia, vol. XI., 1857. He says: "I wish it fully to be understood that I advocate amalgam-fillings in the practice of those who receive liberal recompensation for their time and skill, only in such cases as would otherwise have to be extracted. I have seen hundreds of mouths in which amalgam-fillings have been placed, some recently, and several others years since, and have never in any case seen any injurious systemic effect." Quacks and charlatans using his name in their interest he felt so annoyed, that in the volume of the same year he declares that he never will use amalgams any more, for the following reasons: "In many cases in which they are most relied on as a filling, as in the buccal cavities of molars, when beneath the free margin of the gum, while some remained clean, in many cases there occurs a blackening on the underside, and that color is given to the tooth. Again, in infirm teeth, for which they seemed the only thing, many have to be removed, owing to suppuration of the gums, caused by the tight closing of the previous vent for the escape of the pus. Therefore I have come to this broad conclusion, that teeth so infirm as to need soft fillings would be best removed for the health of the patient." No one can fail to see the flimsiness of the reasons given for not using amalgams.

HINTS ON THE CARE OF THE TEETH.

We find in one of our neighboring dentist's office the following "Hints on the Care of the Teeth," which we are kindly allowed to make use of in the *Journal.* They are printed on folded cardboard in a very neat and tasteful manner, and the Dr. says that it saves him a great deal of time in *lecturing* certain patients, especially children, on the needed care of the teeth. He gives them out requesting the patient to take them home, and hang them up in some prominent place in their sleeping rooms, where they may serve as a reminder of

their duty to their teeth, just at the time when they most need attention. The "Hints" are as follows:

Cleanliness is of absolute importance, and its neglect cannot be atoned for by dental skill.

Thoroughly cleansing the teeth each night before retiring is ordinarily sufficient, and no other cleansing should excuse it at this hour.

The articles necessary to its thorough accomplishment, are the brush, pick, tape, silk or linen floss, and tooth-powder, or prepared chalk.

The brush to accomplish its purpose, should be given an upward motion on the lower, and downward on the upper teeth, and no portion of any tooth should escape its action.

The passage of the floss or tape between the teeth is essential to the cleansing of their approximal surfaces.

A rightly trimmed quill pick is needful, especially after eating.

Children's teeth require daily cleansing by some competent person from the time they commence to take solid food.

For tartar or other special conditions, consult your dentist.

Compliance with these suggestions, not only conduces to the elegant appearance of the teeth, but to the least possible demand for dental operations.

One of the most prominent dentists thus closes his letter to us: "Well, success to the N. E. Journal. There is abundance of room for there is a multitude of dentists who are fully up abreast of progress, and they need a journal that shall discuss other things than vulcanite and amalgams—that shall not fail to recognize TRUTH in whatever garb she may appear, nor cease to worship her though she may ruthlessly rend to tatters the cobweb framework of our very dearest cherished theories."

We recommend to all dentists, who are not more or less skilled tooth-workmen, the reading of the article on albuminoids in this number of the JOURNAL. Much vague talk about teeth might be avoided if dentists knew about these substances.

If dentists must use tobacco, let them try Dr. C. Graham's deodorizing mouth-wash, made as follows: To a table-spoonful of water add twenty to thirty drops of bromo-chloralum. It is said to work like a charm, being odorless itself, yet destroying instantly the after-effect of the weed upon the breath.—*Selected.*

OPERATING TABLE AND LABORATORY.

THE USE OF MATRICES IN FILLING TEETH.

About ten years ago, Dr. Louis Jack, of Philadelphia, invented a system of matrices for use in filling the approximal cavities of molars and bicuspids, and though they were advertised to a considerable extent at the time, we do not think they met with the favor they most certainly merited. It would seem difficult to conceive of an operator being without them who has once acquired their use, and become convinced of their real worth. Though it may not be possible to very largely introduce those invented by Dr. Jack, and for sale at the dental depots, it may be possible to induce the profession to use a modification of the same, such as the writer has been using for some years. Those invented by Dr. Jack, we infer, were designed for use in filling with gold, though possibly as well with other filling material.

In our own practice we receive the greatest assistance from them in filling with amalgam, and especially in those cases where decay has extended far under the margin of the gums. All that is required in the construction of these appliances, is the uncut ends of separating files of different thicknesses, or any metal plate of the requisite thinness and stiffness, to which the amalgam will not adhere. They should be cut in form somewhat like the letter D. The curved edge, which is designed, if necessary, to slip under the margin of the gum, should be beveled off to a somewhat sharp edge, and the plate bent to fit around the tooth, giving all the prominence desired to "knuckle out," if that object is in view. Place in position, forcing as far up as required to nicely cover the curvical wall of the cavity, and retain in position with a common orange-wood wedge, or, if the adjoining tooth is missing, with a block of wood sufficiently large to fill. The matrix should not be so wide as to prevent ready access to the cavity. It is well to have several at hand, of different widths and thickness, that any case may be readily fitted. It is surprising how free from moisture these appliances will keep a cavity, even without the rubber dam. In these large approximal cavities, extending through the grinding surfaces of the teeth, we feel assured that but few amalgam fillings are thoroughly packed. Either the material is left too soft and pasty for a good filling, or, on the other hand, the filling is very porous. In either case, the operation is stamped failure.

With the matrix method, the amalgam may be mixed very dry, and

packed with the mallet. The result is a filling so dense that a very good finish can be given at the same sitting, and that will merit confidence. Try it, and be convinced.

RESETTING PLATES.

Let me tell Dr. Benjamin of a still better way to reset rubber plates where the absorption requires a new plate. We often insert full upper or lower dentures in from three to eight weeks after extraction, and find that in many cases the patient desires the same expression and articulation in the new plate as in the old.

If he will with a small bur cut out the rubber from the inside of his plate thoroughly, to the depth of at least a line, and line the plate so cut out with a thin covering of extra soft modeling compound, and warm the case, he can insert in the mouth, and while the material is yet soft, get exactly the same bite as before. Then on withdrawing it he can trim off the edges and find a surer impression than is possible with wax. Now let him insert the plate in the lower half of a deep flask, at an angle to insure its "drawing," fill with plaster around the plate flush with its edges, silix his plaster or oil it if that's his way, and fill upper half very carefully. Steam thoroughly, and on removing, save every atom of modeling wax, and measure it in your rubber measure. Cut waste gates by filing little channels in edge of band. In packing the case, use just the amount of rubber your wax measures, as this is the secret of perfect closures and no checking of blocks. If you want to use an air chamber, put it on cast as usual, and cut out a piece of rubber same size, and subtract it from amount of measured rubber.—C. J. RATHBUN, in *Items of Interest.*

GUTTA-PERCHA.

Dentists occasionally complain of gutta-percha swelling or bulging from the cavity. This is no new thing; gutta-percha will so act in many mouths in *living* teeth, *never* in dead teeth. Line all your cavities with some resinous substance; rosin dissolved in ether is well adapted. Use a small pencil brush, dip in the fluid to fill the dental tubuli, and you will have no further bulging. Work your gutta-percha with as low degree of heat as possible. Manipulate your filling until you are convinced that it is sufficiently chilled, then remove all superfluous material. I have known teeth partially filled with gutta-percha capped with gold to burst from no other cause than the acids in the dental tubuli acting upon the gutta-percha.—*Herald of Dentistry.*

CHEMICAL FACTS, HINTS AND QUERIES.

GYPSUM

is so much used by dentists that a little sketch about its nature, etc., might seem of interest. The sulphate of lime or calcium sulphate or calcic sulphate or gypsum, all of which designate about the same substance, is a combination of sulphuric acid and caustic lime, as the old chemists called it; or it is a sulphuric acid whose two hydrogen have been substituted by the bivalent element calcium—this is the present view; the old formula—without any water—was Ca O SO_3, the new one is Ca S O_4. This compound exists in nature under the name of anhydrite; it may be obtained by melting common plaster; it is hard crystalline and when pulverized, it does not harden with water. In the incrustations of boilers there occurs a compound precipitated from the hard water with 6 per cent. crystal water, *which does also not harden* with water. The common gypsum is the substance with 21 per cent. of water. This gypsum occurs at many places, though chiefly near Paris, where there are great quarries for it; this gypsum when gently heated to 132° Centigrade (266° F.)—loses its water and afterwards may take it up again, hereby assuming crystalline structure, while the water becomes solidified into the "crystal water." This property is what we make use of in making the plaster-casts; theoretically about one-fourth of the weight of plaster of Paris should be taken as the amount of water to be mixed with it—exactly 27 per cent.—but as this is not very easy to mix, generally a little more is added which has the effect to make the casts a little softer, though by evaporating afterwards it does not permanently injure the hardness. Too much water "drowns" the plaster; it assumes the crystalline structure without allowing the crystals to become interwoven because of the water between the crystals. Plaster heated to 204° C. (399° F.) does not take up water quickly at common temperature and does not harden at all. Many substances hasten the hardening of the plaster and render it harder. The best of them is sulphate of potassa, the casts are very smooth but unfortunately they do not resist the action of boiling water; the water will dissolve away the sulphate of potassa, and the remaining hydrated gypsum is frail and porus; far less advantageous are other admixtures like glauber salt, common salt, etc.; all kinds of potassa salts—e. g., potassa-alum, hasten the process of hardening, while soda-salts are almost indifferent; plaster mixed with tartarate of soda-potassa (seignette-salt) and

water hardens almost instantaneously. Where plaster has to be exposed to the action of hot water, it is best to use no admixture all, to mix the plaster relatively dry and to use plaster that has not been exposed to air—chiefly if moist—for too long a time. By experiments we found that plaster in an open paper bag took up in one year, in a medium dry room, 5.7 per cent. of water and hardened but slowly and imperfectly; after being entirely deprived of this moisture and being allowed to stand for 5 days in an open vessel in a damp room, it took up 2.3 per cent. of water. The essential condition for good plaster-casts are therefore:

1. Finely powdered plaster;
2. The plaster properly calcined;
3. The water well mixed with the plaster;
4. Avoidance of too great an excess of water;
5. Protection of the plaster against access of air and moisture before its being used;
6. If the casts are steamed, admixtures of salts should be avoided.

The mineralogical names are: Anhydrite for plaster without water; alabaster for the pellucid variety with 21 per cent. water; selenite for the mica-like variety with 21 per cent. water; gypsum for the rock-plaster with 21 per cent. water as found at Montmartre near Paris, etc.; the term plaster of Paris should be used only for the calcined gypsum before it has been used for casts. M.

We mentioned in our last number the fact that not only acids dissolve lime salts but even natural and alkaline liquids. We made a few experiments with sugar as to its solving powers for lime salts and found that it was lower than supposed, e. g., in Gmelin; 1 part of carbonate of lime required at least 8,000 parts of solution of sugar for its dissolving. But this does not alter the fact that the lime-salts are soluble in many neutral liquids. M.

On examining some of the powder known as "Vegetable Sozodont Tooth Powder," I found it to be composed chiefly of diatomaceous material, the forms being in both perfect and fragmentary states. The other constituent seemed to be some flavoring matter which gives the powder its peculiar taste. Various forms of *Navicula* and *Pinnularia* occur in great abundance. Also small and delicate forms. When mounted in balsam, the powder makes an interesting object.—C. W. G., PALASADES, N. Y., correspondence of *American Monthly Microscopical Journal.*

SOCIETIES.

At the Annual Meeting of the Mass. Dental Society, held in Boston, December 8, 1881, a Committee on Resolutions was appointed who approved and adopted the following:

Resolved, That we, the members of the Mass. Dental Society, have heard with regret the sickness and death of our Honorary Member, *Joshua Tucker, M. D.*, of Boston, known to us many years as a *faithful dentist*, a *loving friend*, and a *conscientious* and *upright man;* and although his years were many, his life and conversation had in it the charm of a spirit endowed with the freshness of youth.

Resolved, That so faithful a life, and one so full of earnest purpose, is a bright example for our practitioners and the youth of our land to follow; for, by so doing, they will receive, as he did in his later years, the applause of wise and good, and the satisfaction of his own heart and conscience.

Resolved, That we extend our kindly sympathies to his widow and to his relatives and friends in the time of their bereavement, and we trust that the immortal part of him has entered into the higher life of which he was a firm believer.

Resolved, That these resolutions be sent to the family of the deceased and a copy of them entered on the record of this Society.

(Signed) D. B. INGALLS, *President.*

W. E. PAGE, *Secretary.*

J. T. CODMAN,
I. J. WETHERBEE,
EDWIN P. BRADBURY, } *Committee.*

In societies that have recently adopted a system of dividing *the work* annually among the membership into sections, there exists among some of the members, who, not being acquainted with the system, a misapprehension as to what is expected of them. That is, if they are unacquainted with the method, they expect by the notice sent them of assignment to a certain section, that something imperative or positive is expected of them in the shape of a paper, a report, or something definite to be presented at an ensuing meeting. Now, while this is to a certain extent true, and that *all* members are earnestly and cordially called upon for some contribution, be it large or exceedingly small—which, if the latter, may be embodied in a general

report by the chairman of the section that would come properly under the head of their respective sections, it should be at the same time understood that there is nothing obligatory about it.

It should be understood that there is nothing more expected of those who cannot or who are unwilling to make reports, or write papers, than there was expected of them under the old and threadbare system of a half dozen members doing *the work* for a society with a membership of from one hundred to two hundred, unless it is that they are cordially invited to attend the meetings and get acquainted with such progressive work as they now do not understand.

It should be understood that when the American Dental Association first adopted this system—that works so beautifully now—some sections were passed without any report *at all.*

It should also be understood that this plan succeeds as well in small societies as in the larger ones, because the principle is right. Some of the district societies of New York State have adopted and admire this method of work.

It would be well if all members of Dental Societies adopting this plan of division of the work into sections, could feel concerning it at the beginning as they certainly will when the subject is comprehended; and the best way to understand and appreciate this excellent plan is to attend the meetings of *live* societies. The presence of members is worth very much, even if some choose to take no active part in the proceedings of the meetings.

[*CORRESPONDENCE.*]

In reply to Prof. Mayr's criticism of the discussion of Dental Caries, at the American Dental Convention last summer at New York, as one of the participants of that discussion, I will say that Magitot's experiments prove that sugars, *as such*, do not dissolve out the lime salts of teeth. It is true that the carbonate of lime is held in solution to a considerable extent by ammonium chloride, and it is also true that *ammonium chloride will not decalcify bone or tooth substance.* I have yet to see a cavity where dental caries is in active progress that does not give a distinct acid reaction when tested with litmus, and have never seen one that was alkaline or neutral, except when caries was arrested and the pulp had made an effort to solidify the circumscribed portion of dentine about the cavity. All of which inclines me to surmise that even professors are sometimes tempted to "*theorize.*"

E. S. NILES, Boston, Mass.

GEORGE E. HODGE,

MANUFACTURER OF

DENTAL SPECIALTIES,

AMALGAMS AND RUBBER DAM.

I include in specialties my HAND-PIECE for the Dental Engine, and HONED BURS.

I am supplying from my own factory a full Dental Engine Equipment, Burs in all the shapes and sizes, such as are in general use. Our Honed Burs are of a very *superior quality;* and already are in great demand.

Price of Ordinary Burs, per dozen	.....	$2 40
" Honed Burs, " "	.....	4 40
" Hand-Piece,	.....	10 00

Our Hand-Piece is a universal chuck worked by a threaded nut. It runs upon stout taper or cone-bearings. It has required many months of labor and study to arrive at its present state of perfection. Now the large and increasing demand for it is sufficient proof of its excellence.

We have aimed to produce a tool, which, while it should be perfectly simple, yet should have *absolute steadiness* in the carriage of the bur, drill or other instrument; and at the same time should have endurance without any *weak points.* We know now that we have succeeded in our effort.

Letters are constantly coming in which give the most ample testimony in favor of our Hand-Piece. We append four of them:

25 WEST 27TH STREET, NEW YORK, July 20, 1881.

Dear Sir: After having used your Hand-Piece constantly for several months, it is but justice to tell you how much I am pleased with it. I think the principle upon which it is made, is without exception the best principle for such an instrument, and I believe that a Hand-Piece made in this way will run steady and true longer than by any other method. I have used various other hand-pieces, and I regard them all as inferior to yours. The objection which I at first felt of its being to large, has entirely passed away, and its size does not now disturb me.

NORMAM W. KINGSLEY.

BOSTON, July 22, 1881.

I have thoroughly tested your Hand-Piece for the Dental Engine and find it to be excellently well made, holding the points *securely*, with no prospective wear, by which so many hand-pieces *soon* become useless. It is the best Hand-Piece now in the market.

ISAAC J. WETHERBEE, D. D. S., *President Boston Dental College.*

NEW YORK, December 21, 1881.

Dear Sir: Allow me to say, after using your "Universal Chuck" Hand-Piece for over twelve months, that it is the best I ever saw, and gives me an opportunity of using any and all of my old burs. It is, I believe, well made, and to-day runs as well or better than the first day I used it. Very truly, A. L. NORTHROP, 44 West Forty-sixth St.

NO. 100 BOYLSTON STREET, BOSTON, Jan. 30, 1882.

MR. GEO. E. HODGE: *Dear Sir*—It has been my custom for years to get all the Engine Hand-Pieces as they are put upon the market. I have thus had your several forms, and have been familiar with the changes and improvements. I am happy now to authorize you to use my name in commendation of your latest form. It runs smoothly and evenly, holds the bit firmly and is easily managed. The principle of the Universal Chuck is very advantageous and economical, and the placing of the set-nut at a distance from the mouth end of the tool is admirable. From my knowledge of its mechanism, and an experience of many months, I consider it very durable. It is also very cleanly. Yours, truly.

L. D. SHEPARD.

GEORGE E. HODGE,

161 West Twenty-ninth Street,

P. O. Box 29, Station D, - - - - NEW YORK CITY.